

Developing Supply Chains to support Service Operations ...

This material is intended to be used as the basis for the illustration of how supply chain principles and processes are at work in service operations. It is intended for class discussion rather than to illustrate effective or ineffective handling of management situations.

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Developing Supply Chains to support Service Operations ...

An introductory module for use in the classroom

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Module Objectives

- **Understand how supply chain principles and processes are critical to supporting and delivering services**
- **Understand how goods availability (components and finished goods) must be coordinated with resources and expertise to meet a service demand**
- **Understand (at a high level) the evolving / maturing nature of services based businesses and the emergence of “Services Science”**
- **Develop a basic understanding and awareness of how to market your skills and knowledge in Supply Chain management across multiple service based industries**

Developing Supply Chains to support Service Operations : Module Outline

- **What is a “Supply Chain”?**
 - Principles
 - Concepts
 - Processes
 - An Example of a Supply Chain
- **What does “Services” mean ?**
- **Why should we care –why is it important?**
- **3 examples of where supply chain principles are being applied in the Services Industry**
 - Business Consulting services (IBM Company)
 - Gas and Oil Exploration (XYZ Company)
 - Software Services
- **Value Statement / Supporting a Business model**
- **Summary observations & conclusions**

■ **Supply Chain Management**

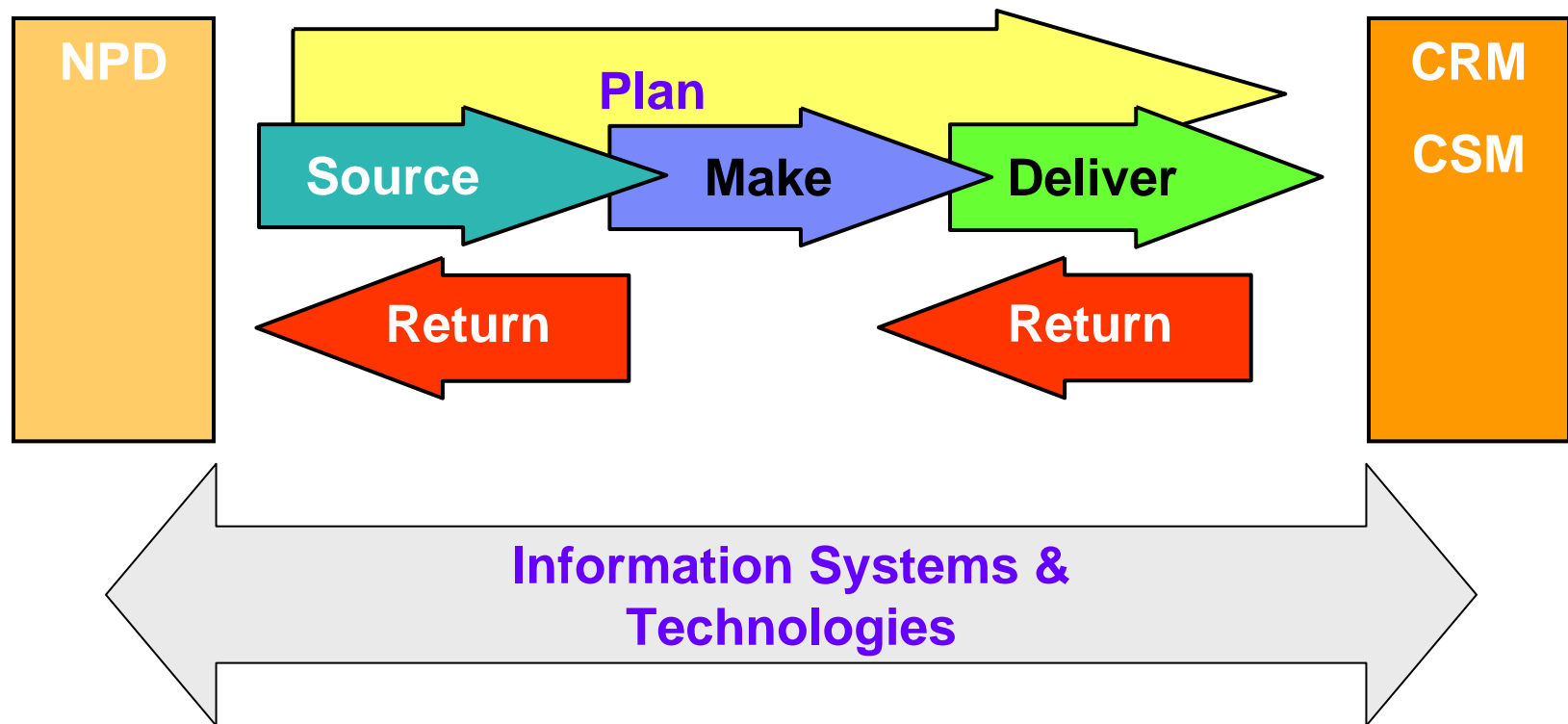
- What is ?
- What are the key functions & processes ?
- What are some examples ?

I. What is Supply Chain Management?

- SCM is a way to **link** major business processes within and across companies into a high-performance business model
- SCM *integrates* supply and demand management within and across firms

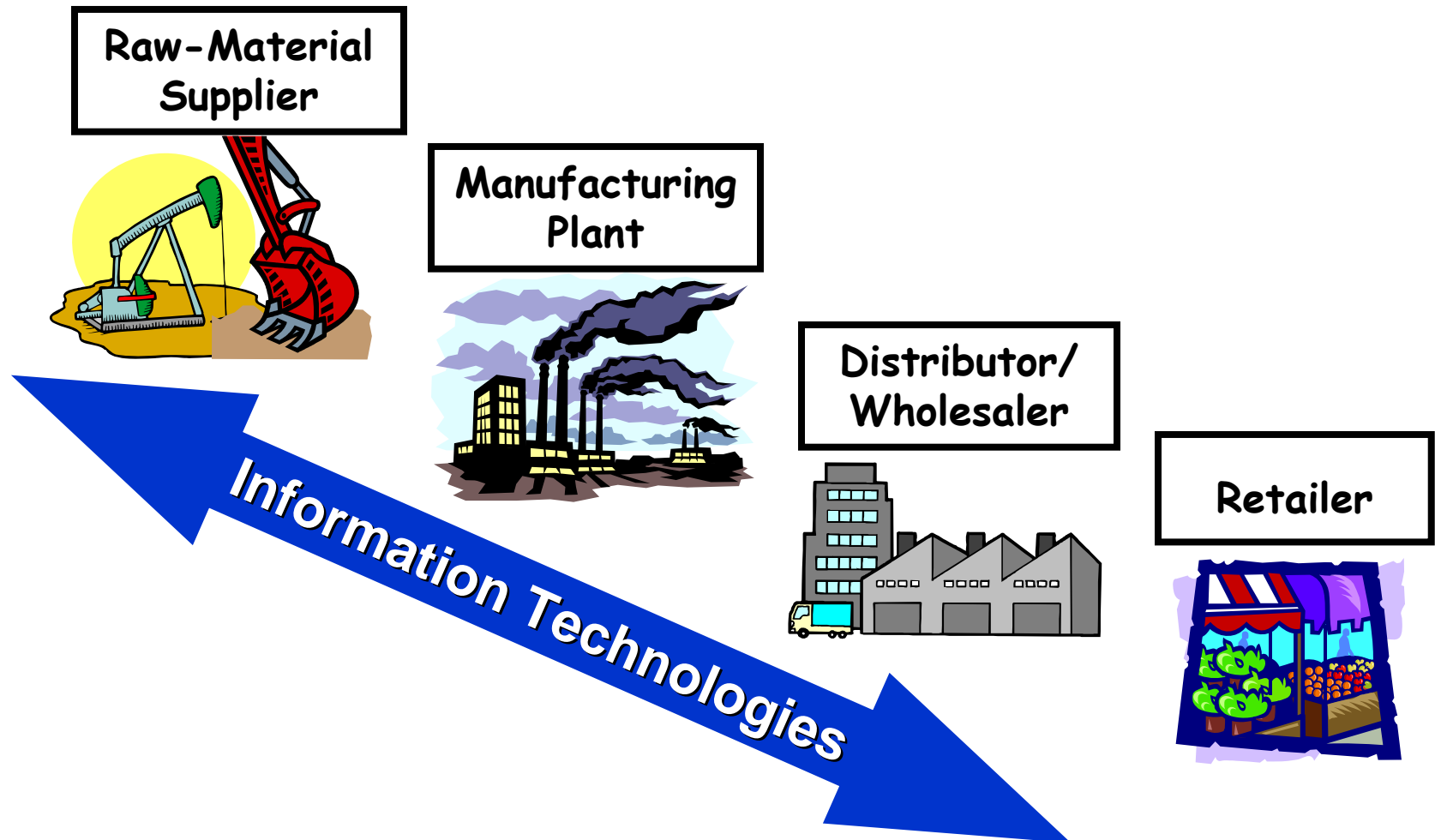
Process Perspective

Core processes



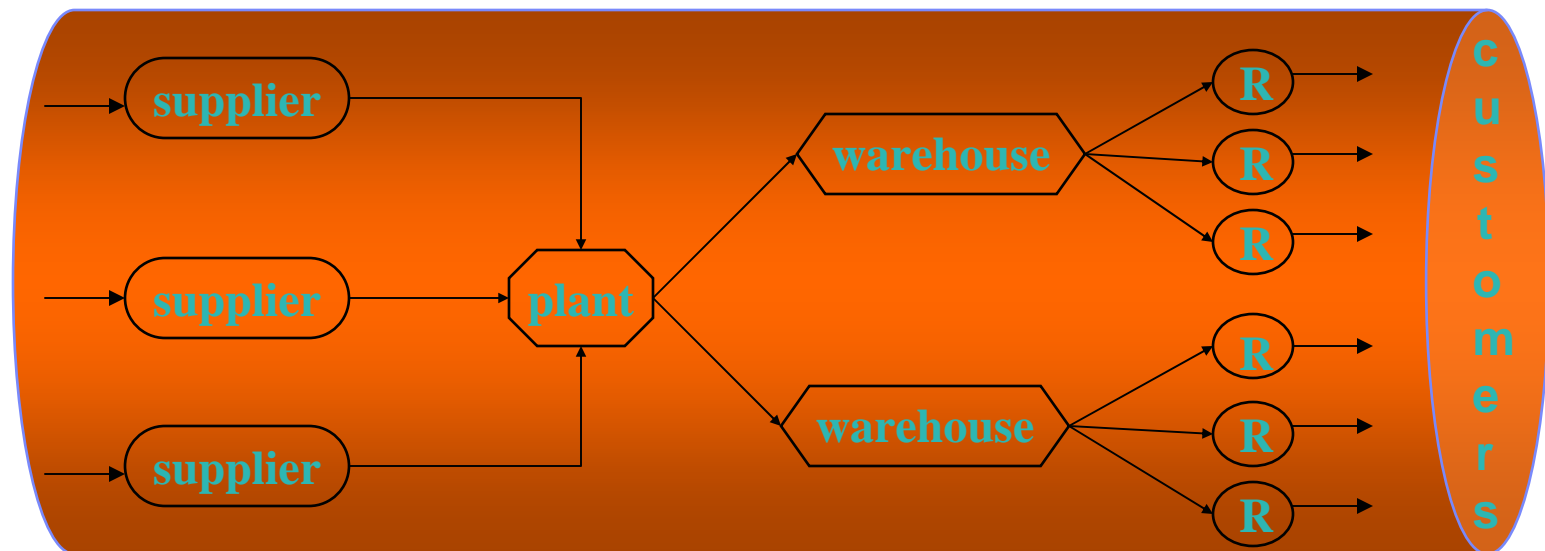
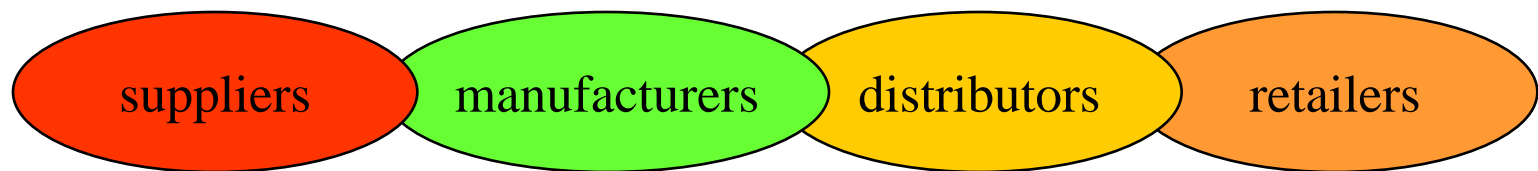
Stages Perspective

Stages of supply, production, and distribution



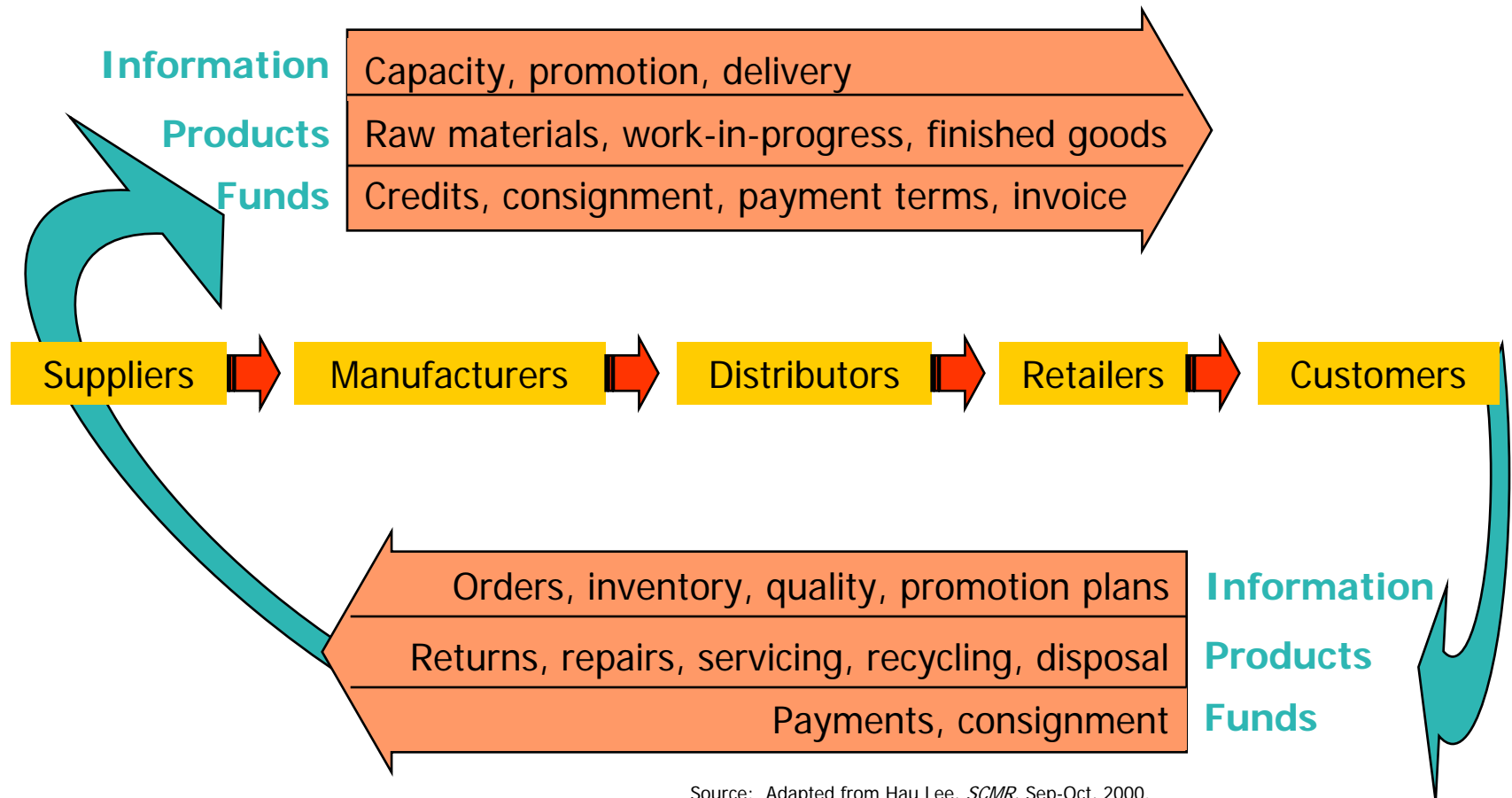
Network Perspective

Links and nodes



Flows Perspective

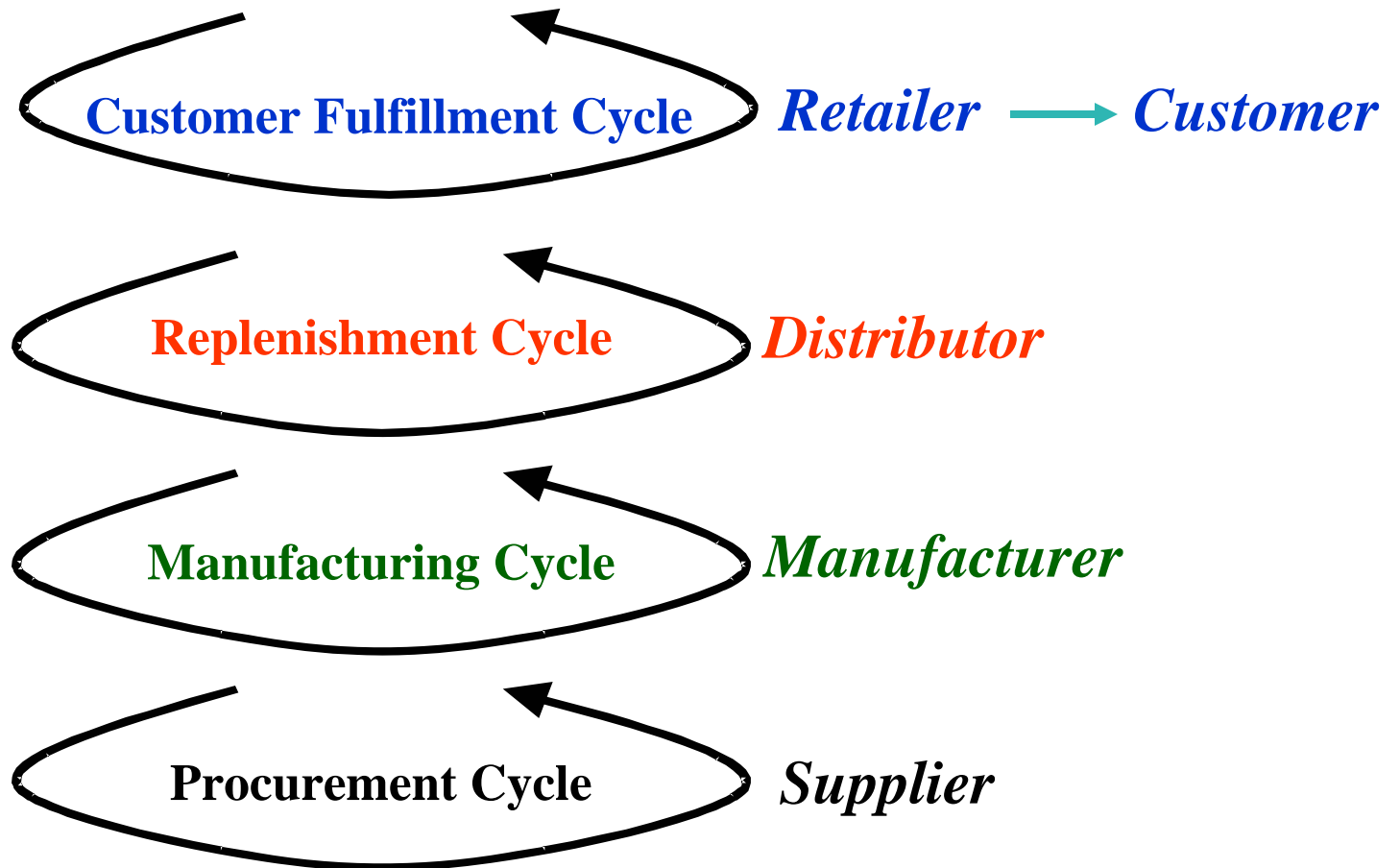
Three key flows



Source: Adapted from Hau Lee, *SCMR*, Sep-Oct, 2000.

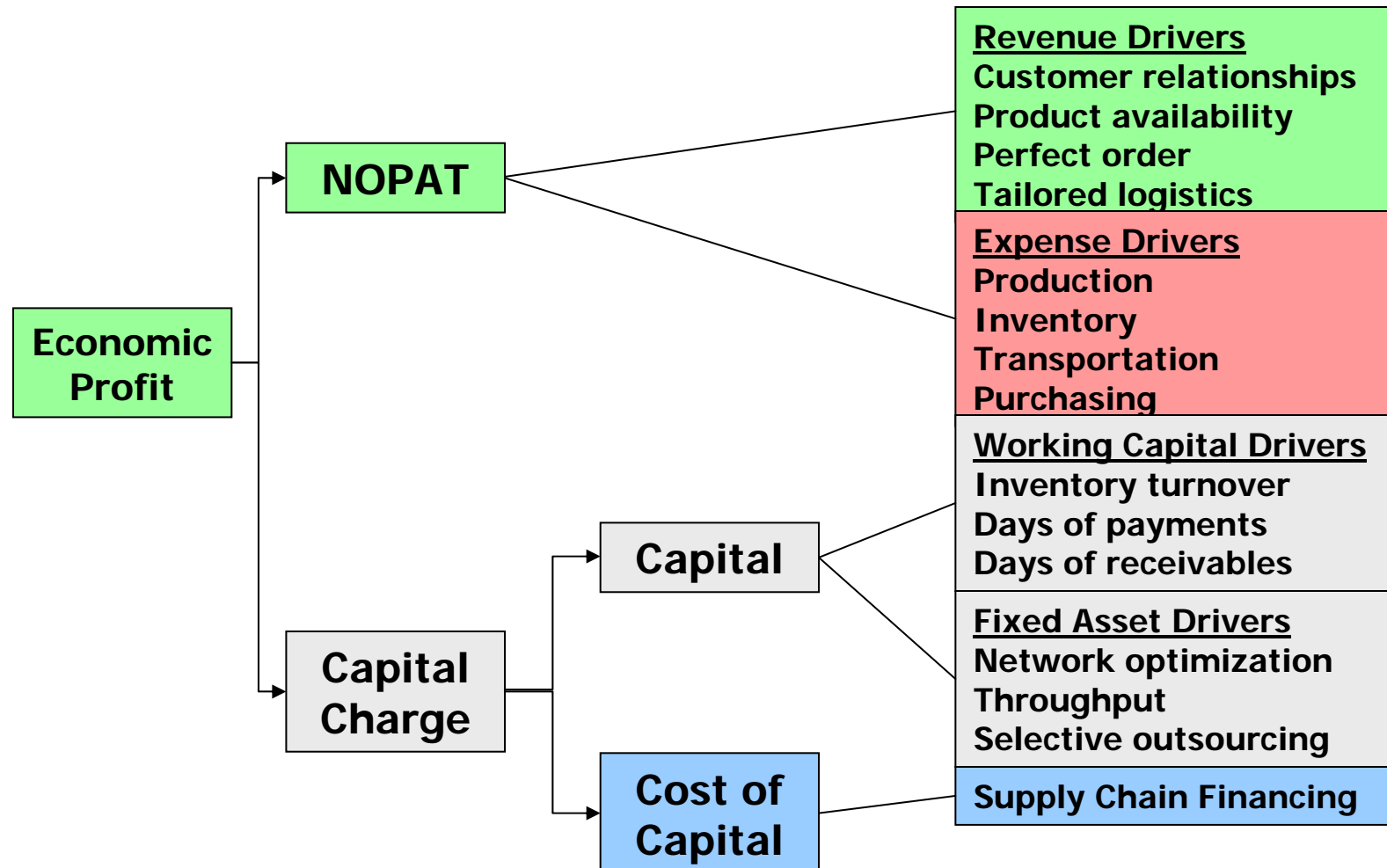
Cycles Perspective

Filling customer requests



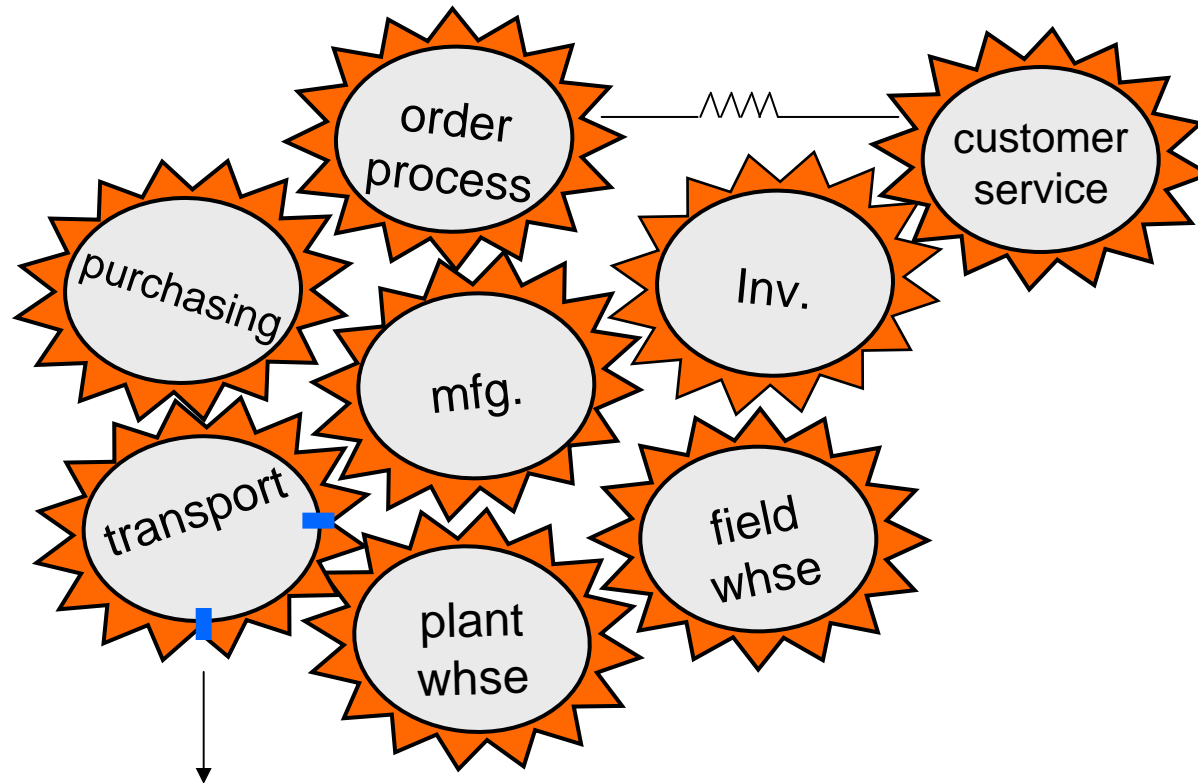
Financial Perspective

Economic profit and SCM drivers



Systems Perspective

Supply chain functions are interrelated



minimum cost

First – what are the definitions of “Services”

- Deed, act, or performance (Berry, 1980)
- An activity or series of activities... provided as solution to customer problems (Gronroos, 1990)
- All economic activity whose output is not physical product or construction (Brian et al, 1987)
- Intangible and perishable... created and used simultaneously (Sasser et al, 1978)
- A time-perishable, intangible experience performed for a customer acting in the role of co-producer (Fitzsimmons, 2001)
- A change in condition or state of an economic entity (or thing) caused by another (Hill, 1977)
- Characterized by its nature (type of action and recipient), relationship with customer (type of delivery and relationship), decisions (customization and judgment), economics (demand and capacity), mode of delivery (customer location and nature of physical or virtual space) (Lovelock, 1983)
- Deeds, processes, performances (Zeithaml & Bitner, 1996)

Supply Chain Management – ‘Traditional’ / ‘Services’

*** Definition; Supply Chain Management** – *“Supply Chain Management encompasses the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management. It includes coordination and collaboration with all channels and partners, Integrating supply and demand management within and across an Enterprise.*

- Supply Chain Management addresses effective and efficient use of:

- Physical assets

- Inventory
- Production capacity

Traditional SCM > ‘Asset’ focused

- Intellectual Capital

- Expertise / Consultation

Services SCM > ‘Resource’ focused

Similarities between Traditional SCM and Services SCM

Traditional Supply Chain Concept	Services Supply Chain Concept
Production capacity	Personnel and expertise
Bill of materials (BOM)	Combination of skill sets
SC Performance measures	Meeting customer expectations
Inventory	Excess capacity or disappointed customers
Forecast requirements	Forecast demand

Why Services & Labor Based Supply Chains?

- **Traditional application of supply chain principles has been for effective and efficient management of asset based business**
- **Evolution of US business environment is increasingly moving toward Service businesses**
- **Primary element of capacity in Service businesses is labor and expertise**
- **Globalization of service businesses adds additional complexity for the effective and efficient use of labor / human resources**

Why should we care – Why is it important? A global challenge for our times

- **Client perspective - right resources right place right time right price**
- **Business perspective – in light of global business maximize efficient and effective utilization of all aspects of the supply chain including.... human resources, capacity, etc**
- **Academia – realization of evolving global service environment**

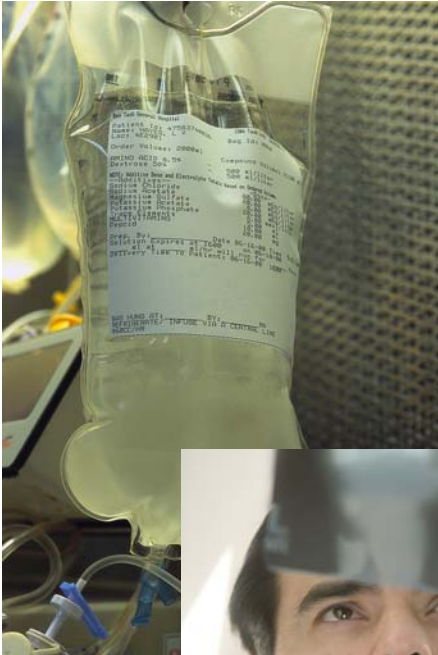
- **Supply Chain Management**
 - What is the Supply Chain of the medical services provider?
 - What are the key functions & processes ?
 - What are some examples ?

A Service Business Example: “A visit to a Hospital for an Elective Procedure

■ **Visit to a medical services provider**

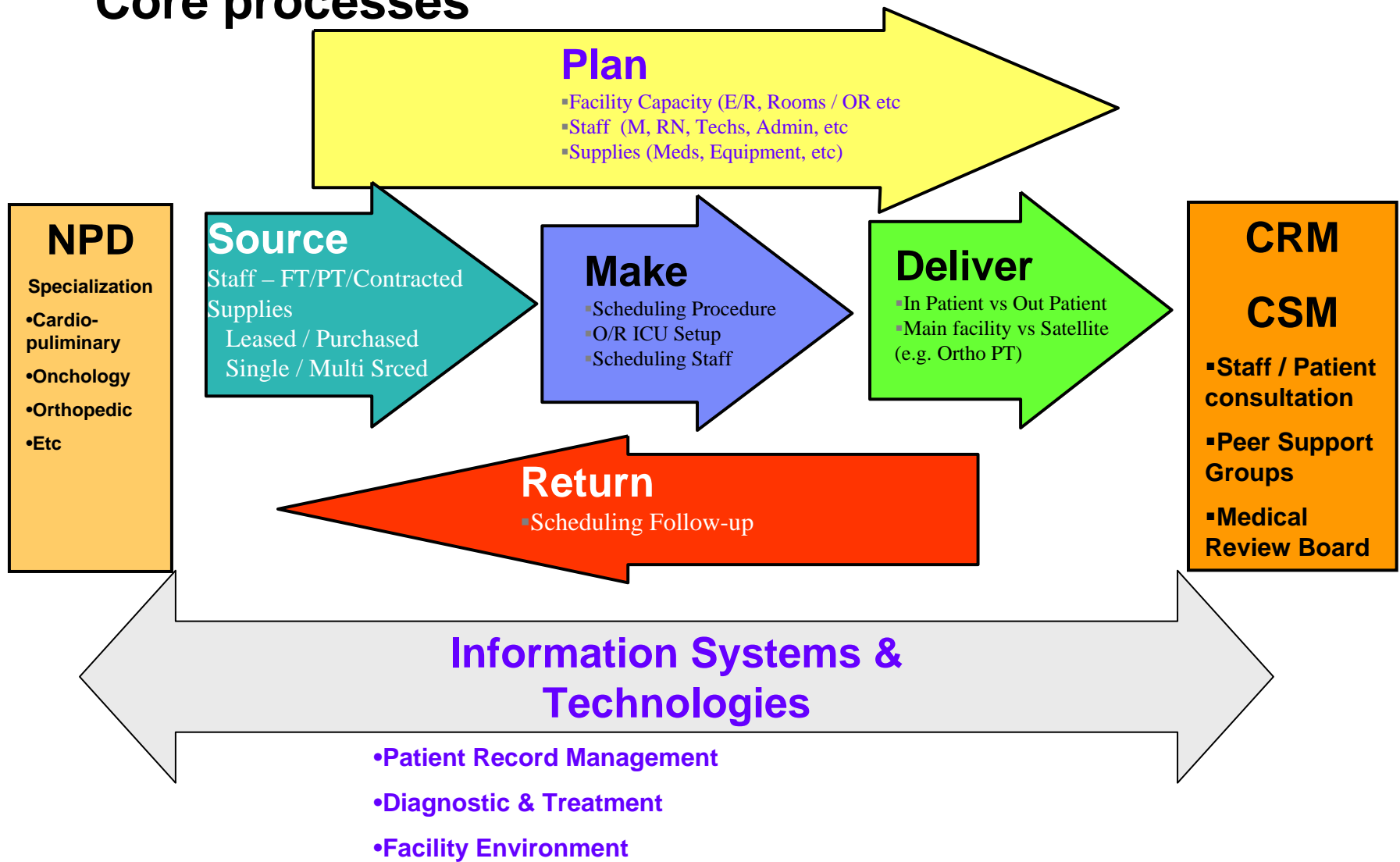
- Medical services visit assumes
 - Right room “supply”
 - with the right staff
 - and the right materials (food /beverage/etc)
 - available in the right quantity....
- Given a “somewhat predictable demand”.....

Resource Requirements for an Elective Procedure



Process Perspective – *Hospital Example*

Core processes



Requirements for Elective Procedures

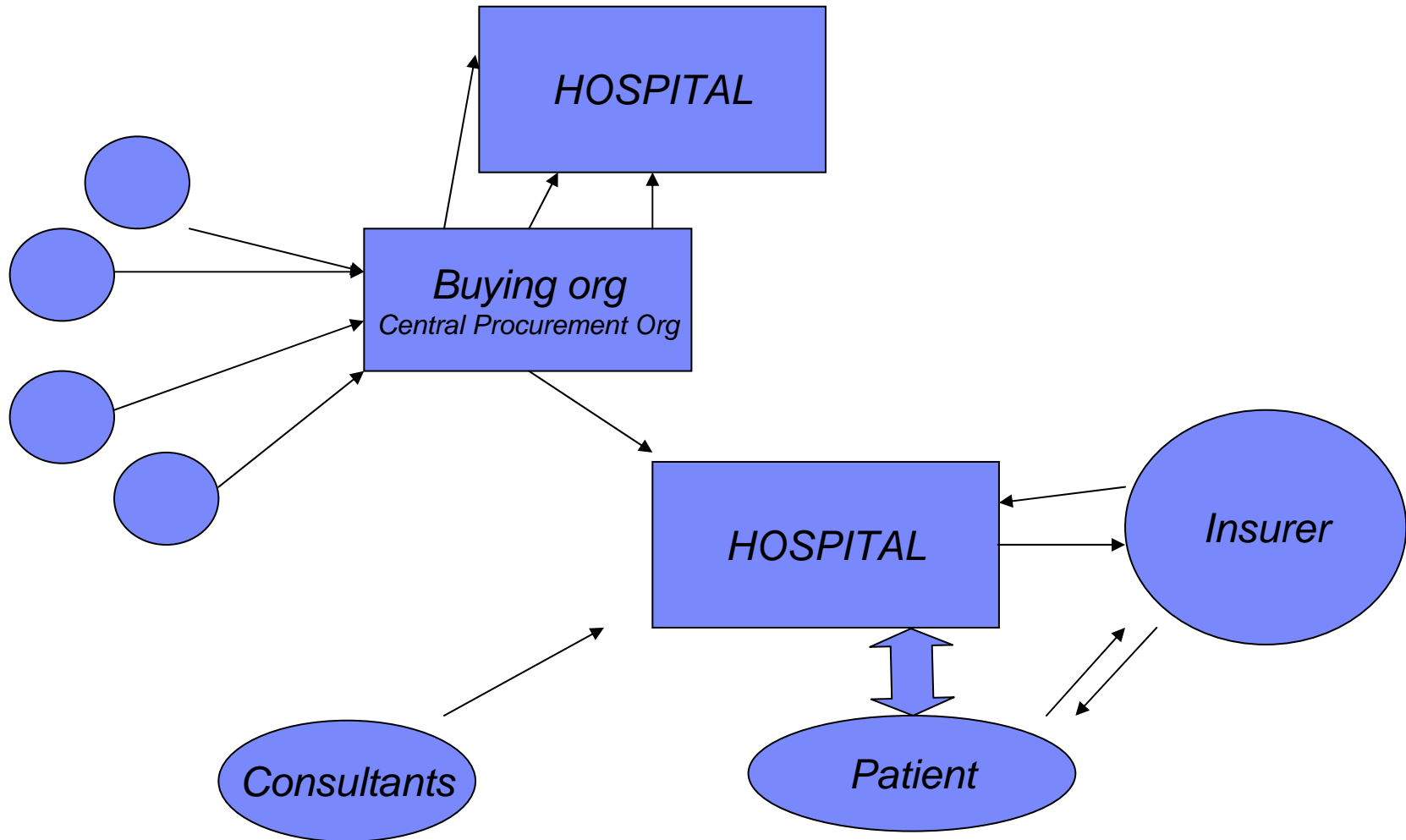
Facilities	Personnel	Resources	Supplies
Prep room	Lab personnel	Diagnostic / Test equipment	Medication
Procedure room	Specialists	Procedure equipment	Patient Supplies
Recovery Room	Technician	Patient Health & monitoring	Surgical Supplies
Patient Room	Nursing		
	Physician		

Performance Objectives:

1. Of the Enterprise / Hospital
2. *Of the Customer / Patient*

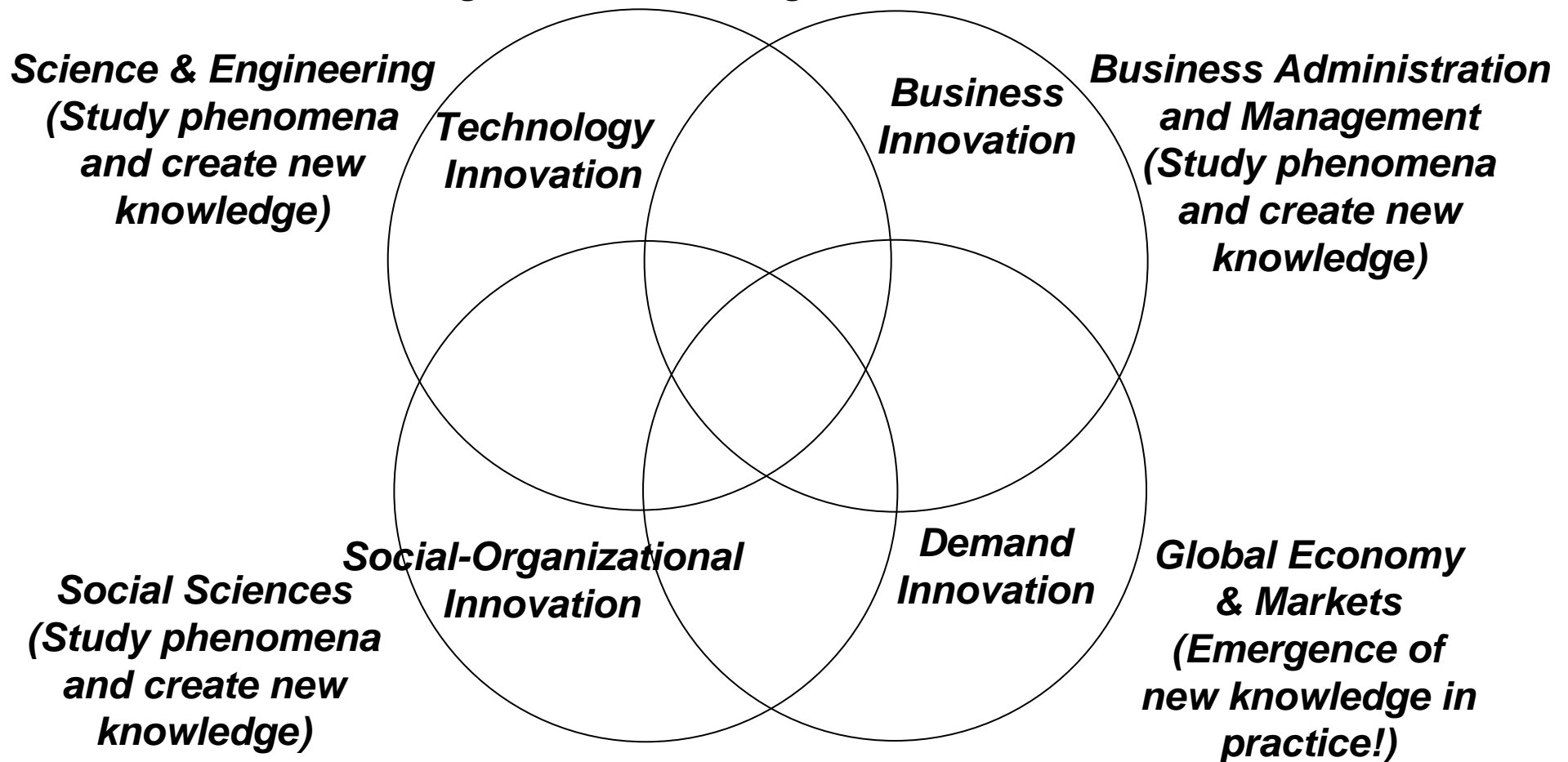
Facilities	Personnel	Resources	Supplies
<ol style="list-style-type: none"> 1. Utilization 2. <i>Customer comfort</i> 	<ol style="list-style-type: none"> 1. Expertise 2. <i>Expertise & Patient interaction</i> 	<ol style="list-style-type: none"> 1. Age vs cost balance 2. <i>Latest & best technology</i> 	<ol style="list-style-type: none"> 1. Excess inventory & obsolescence 2. <i>Availability</i>
<ol style="list-style-type: none"> 1. Fixed and Variable cost mgmt 2. <i>Relative cost</i> 	<ol style="list-style-type: none"> 1. Availability & Utilization 2. <i>Availability & Patient Interaction</i> 	<ol style="list-style-type: none"> 1. Utilization & over investment 2. <i>Patient "Wait time"</i> 	<ol style="list-style-type: none"> 1. Quality & Competitive cost 2. <i>Quality</i>

Medical Supply Chain



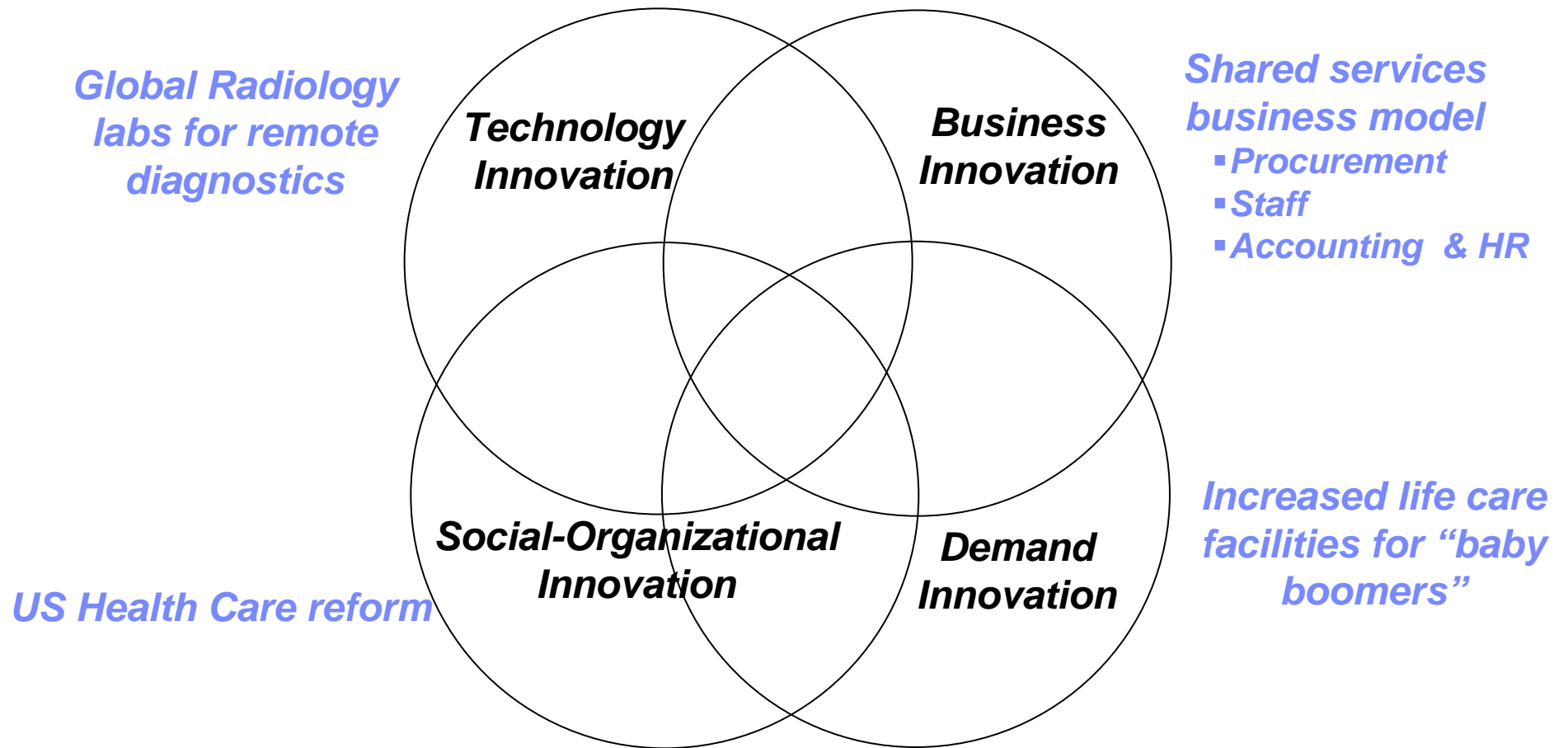
Services are inherently multidisciplinary...

Knowledge sources driving service innovations...



SSME = Service Sciences, Management, and Engineering

Back to the Medical Services Example



Why should governments care?

Because the world is becoming a service system.

Top Ten Nations by Labor Force Size

(about 50% of world labor in just 10 nations)

A = Agriculture, G = Goods, S = Services

Nation	% ww Labor	% A	% G	% S	25 yr % delta S
China	21.0	50	15	35	191
India	17.0	60	17	23	28
U.S.	4.8	3	27	70	21
Indonesia	3.9	45	16	39	35
Brazil	3.0	23	24	53	20
Russia	2.5	12	23	65	38
Japan	2.4	5	25	70	40
Nigeria	2.2	70	10	20	30
Banglad.	2.2	63	11	26	30
Germany	1.4	3	33	64	44

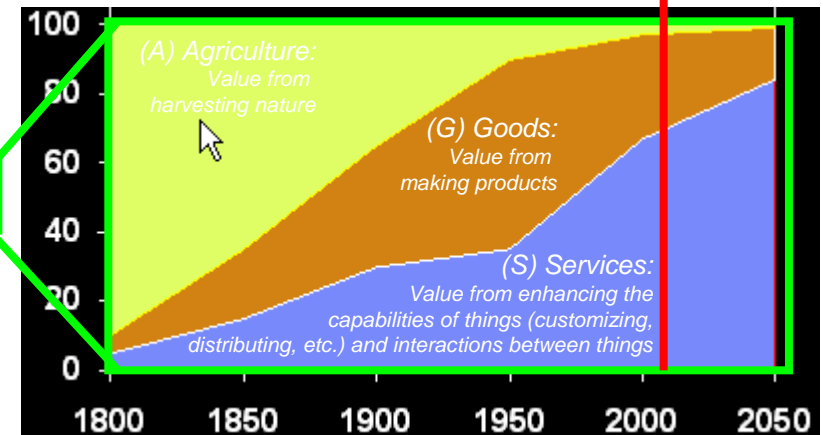
>50% (S) services, >33% (S) services



2004

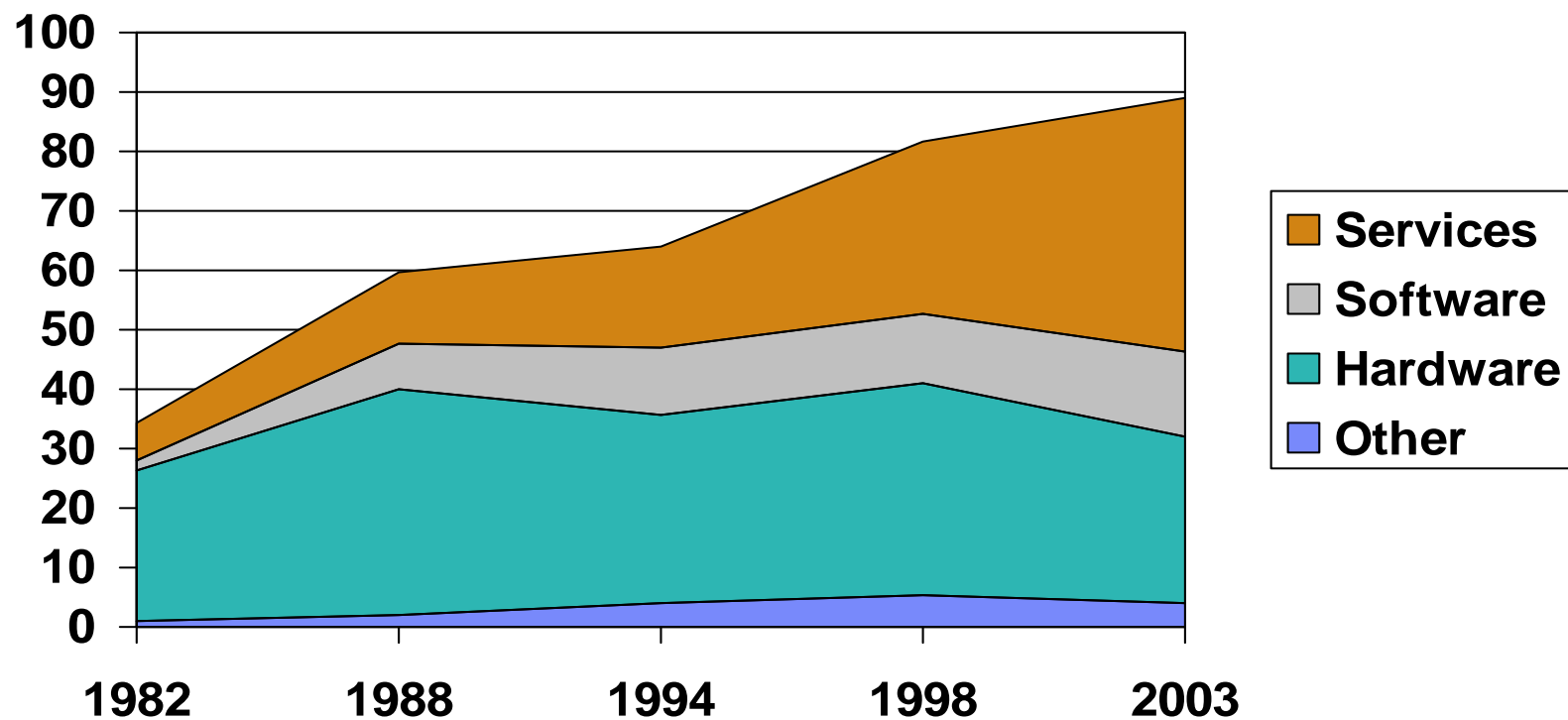
United States

2004



The largest labor force migration in human history is underway, driven by urbanization, global communications, low cost labor, business growth and technology innovation.

Service Innovation - Industry: Why does a company like IBM care?



General Long-term Economic and Societal Trends

- *Elderly population* growing dramatically throughout the world
- Growth of the information industries is creating a *knowledge-dependent global society*
- *Mass migration* is redistributing the world's population
- Growing acceptance of *cultural diversity*
- *Global economy* is growing more integrated
- *Technology* increasingly dominates both the economy and society
- Despite call for alternative energy sources the *consumption of oil* continues to grow

Service Sector Industries in 2004

Percent of sector employment

*ISC is
heavily
involved in
this space*



Professional & business services	14.9%
Retail trade	13.6%
Wholesale trade	5.1%
Transportation & warehousing	3.9%
Information	2.8%

Total	40.3%
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*ISC
contributes
here as well*



State & local government	17.1%
Health care & social assistance	12.9%
Leisure & hospitality	11.3%
Financial activities	7.3%
Other services	5.6%
Educational services	2.5%
Federal government	2.5%
Utilities	0.5%

Total	59.7%
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Source: Bureau of Labor Statistics 12/07/2005

- **Supply Chain Management**
 - What is the Supply Chain of the medical services provider?
 - What are the key functions & processes ?
 - What are some examples ?

Industry Case Study #2

- **Consulting Services**
 - “Developing the Supply Chain of IBM’s service delivery business”

The Challenge

In a business that is labor-based, we need to optimize our human resources.

To get the right person, *with the right skills*, at the right time, place and cost.

Our view of human resources is very broad, including:

- “Buy” - hire a regular or supplemental
- “Make” - redeploy, leveraging learning
- “Rent” - utilize a subcontractor

- By 2025, nearly 25% of the US population – more than 86,000,000 people – will be over 60
- 60% of HR professionals operating in mature markets had difficulty identifying and developing the critical employee skills and talents that are vital to remain competitive*
- An extended workforce of 1 million in 75 countries, speaking 165 languages

*IBM BCS Human Capital Management Study 2005

Matching Demand with Consulting Resources

- **Geography**
- **Expertise**
 - Technical
 - Project
 - Industry
- **Employment relationship**
 - Full time
 - Flex time
 - Contract
 - Outsource

Developing Supply Chains to support Service Operations

- Standardize the taxonomy / nomenclature for defining workforce
- Pool resource for use within / across the business enterprise

- Adapt and utilize demand forecasting using standard taxonomy
- Forecast will drive investment
 - Training
 - Hiring
 - Sub Contracting

Supply Chain Program Design

- Establish end-to-end supply chain based on SC best practices
- Centralized oversight of measurements and investments

Supply Planning

Resource Strategy and Sourcing

Forecasting and Demand Management

Resource Balancing and Optimization

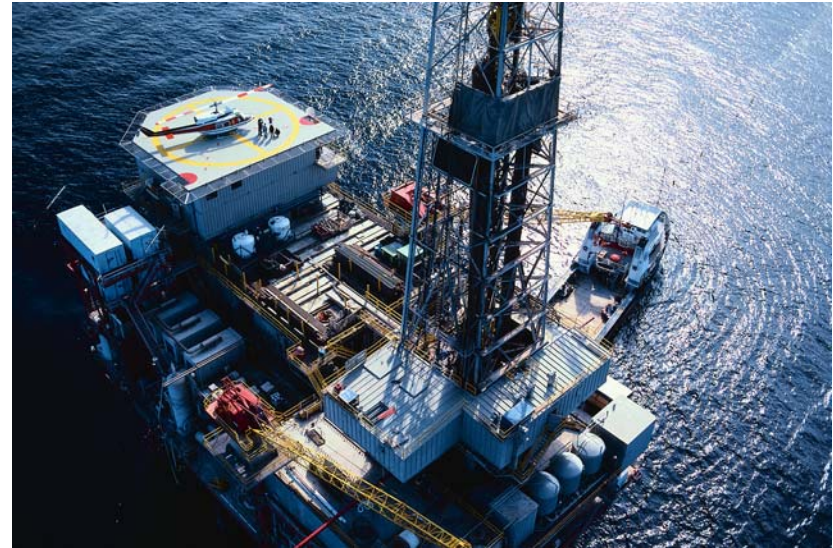
- Establish a workforce strategy that is linked directly to the business strategy
 - Management System to ensure cross-business resource utilization
 - Policies and tooling in place to support optimal use of resources
 - Assess / implement variable labor resource models

- Optimal staffing mix managed to sourcing strategy
- Use of SCM techniques for Demand/Supply planning and operation management

Industry Case Study #3

- **The Gas & Oil Exploration Industry**
- **What does it take to drill an oil or gas well?**

Oil and Gas Exploration



Drilling Requirements

- **Geologists (Expertise and capacity)**
- **Sonar (Resources and capacity)**
- **Engineers (Expertise and capacity)**
- **Drill capability (Resources, engineers, and equipment)**
- **Problem solving (Expertise and capacity)**
- **Take away capacity (Resources and capacity)**
- **Process capacity**

Performance Objectives

- **Enhance return on field investments**
- **Minimize resource requirements**
- **Minimize expertise requirements**
- **Minimize supply and repair inventory**
- **Minimize staff time for coordination**

Performance Objectives: Minimize Total Cost

Facilities	Expertise	Resources	Supplies
Wait time for product	Wait time for product	Wait time for product	Customer delay
Fixed and Variable cost	Variable cost	Usage cost	Variable cost
Under utilization	Under utilized expertise	Over investment in resources	Excess inventory and obsolescence

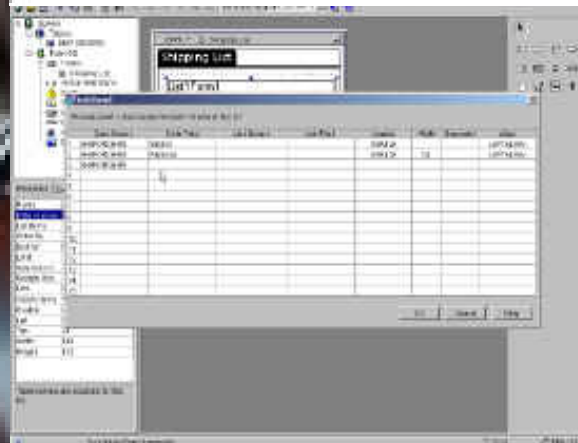
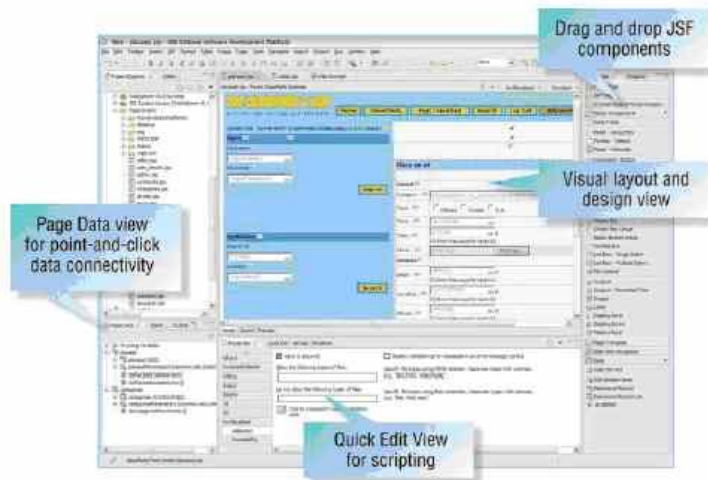
SCM Principals Can Provide Insight to Services Organizations

- **Demand management and coordination**
- **Resource management**
 - Facilities
 - Resources
 - Expertise
 - Supplies
- **Bill of materials (Skill sets)**
- **Resource scheduling**

Industry Case Study #4

- **The Software Industry**
- **Is there such thing as a software supply chain?**

Software Development

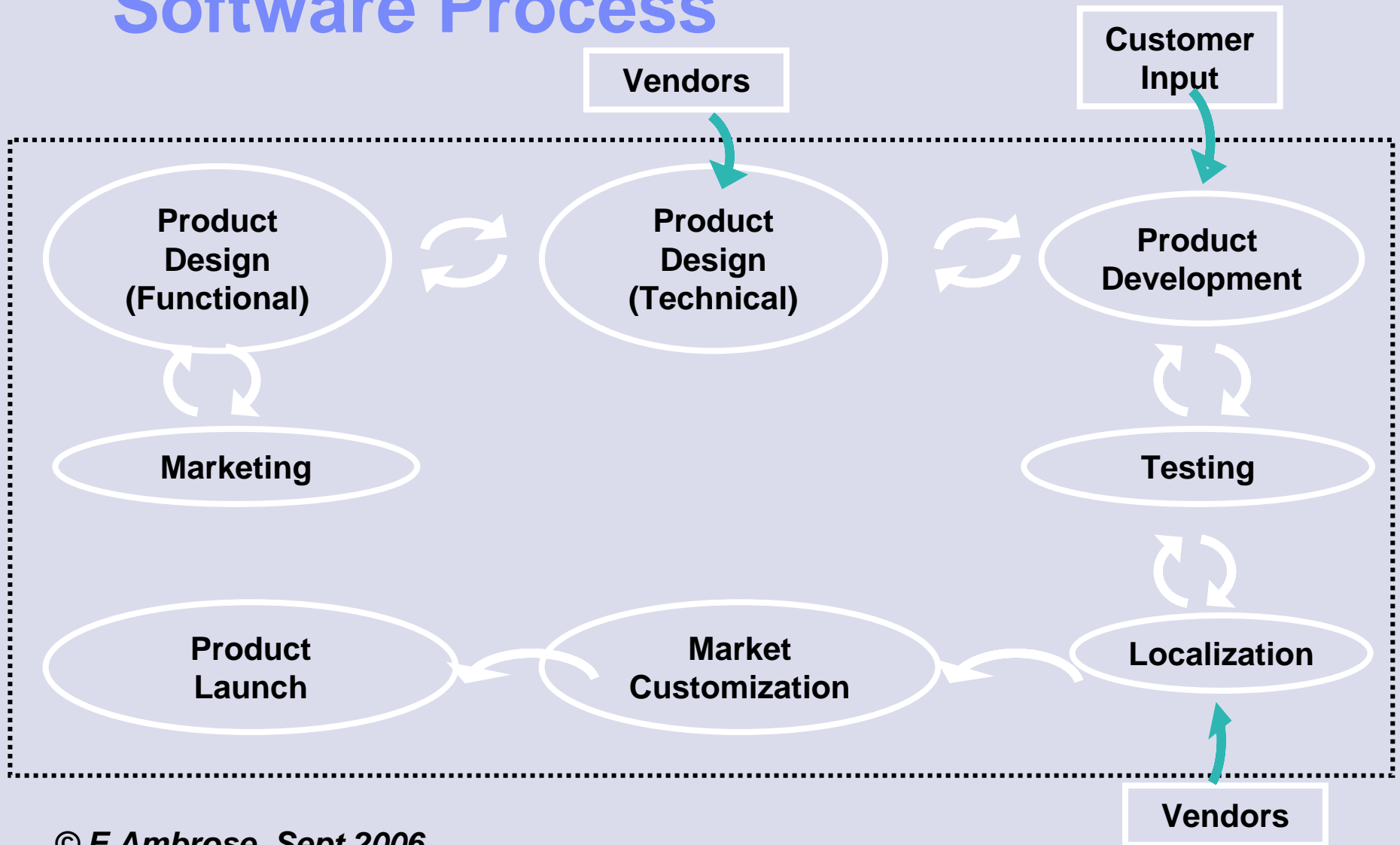


*Images
taken from
IBM
websites.*

Software Supply Chain

- **Information based products have all the characteristics of physical products, except space requirements**
- **Inputs typically programming expertise and customer requirements**
- **Process type typically project based, so delivery time is a key performance measure**
- **Characterised by iterative steps in the supply chain rather than a linear process**

Software Process



© E.Ambrose, Sept 2006

Software Requirements

- **Programmers (Expertise and capacity)**
- **Hardware (Resources and capacity)**
- **Project Managers (Expertise and capacity)**
- **Customer Input (User requirements)**
- **Software (Programming software, development tools, etc.)**

Performance Objectives

- **Capture and implement customer requirements**
- **Eliminate field errors (cost of failure)**
- **Meet standards**
- **Minimize cost = programmer hours**
- **Software compatibility**
- **Localizability**

Performance Objectives: Minimize Total Cost

Facilities	Expertise	Resources	Time
Hardware capacity utilization	Programming efficiency	Schedule adherence	Programming efficiency
SW Production & Distribution	Under utilized expertise	Over investment in resources	Debug schedule
			Customer issues

Recognize Differences in Physical and Services SCM

- Human process times and capabilities are often (though not always) less predictable than machine process times
- Human resources are certainly more trainable and often more flexible
- Services service requirements are often less well defined

Defining a Services Business Model

- ***Business Model:*** the way a company intends to generate revenue and profits from its various markets through its service offerings.
- It encompasses defining a robust value proposition for the services offered.

Services Value Statement

- ***Value Proposition*** is a statement summarizing the customer segment, competitors and the basic differentiation of one's services from the offerings of competitors.
- A value proposition should answer the question:
“Why should a customer buy *this* service?”

Defining Services Value Proposition

Can you define the “Value Proposition” for the services offered in the example case studies?

- Medical Services Supplier
- IBM Consulting Services
- Gas & Oil Exploration Company

Summary Observations & Conclusions

- There is increasing need to coordinate availability of goods and services while minimizing variable and resource cost.
- Supply chain principles can assist in minimizing total cost of providing services.
- Broadening your perspective of supply chain applications extends opportunities for supply chain influence and potential career options.